

growth of the plant commences by the absorption and conversion of carbonic acid into woody fibre through the instrumentality of water and the yellow rays of light—for it appears to be established, that the first formed green containing many compounds, while solar light reflects the green rays, absorbs the red, and transmits only the yellow and some of the blue rays, these enable the plant to decompose carbonic acid and combine its constituents with the oxygen of the atmosphere. Among other illustrations of the powers and properties of light, the lecturer explained the Daguerreotype process—which goes on thus, a plate of copper being previously coated with silver is exposed to the vapour of iodine which forms with the silver a compound called iodide of silver, extremely susceptible of the influence of light. When a picture is prepared is placed in a Camera Obscura a picture of an object is made to fall upon it—the lights and shadows of the picture impress the iodide of silver with different degrees of opacity, according to the greater or less depth of the shadows. The effect of the iodide is the crystallization of its particles, more or less complete. The plate is then submitted to the action of vapour of mercury whereby the crystallized portion of the iodide is decomposed—but the uncrystallized portion remains unaffected, the plate is in fact corroded by the vapour of mercury, and only those parts impressed by the light which came upon it when in the Camera Obscura. The iodine liberated by the mercury penetrates deeper into the plate, combining there with fresh portions of silver. The concluding operation consists in washing off the unaffected iodide of silver by means of a solution of common salt or other suitable compound. The lecture elicited frequent marks of approbation from the audience, and considering that it was given on the spur of the moment, too much praise cannot be given to Mr. Hind for the courteous and obliging manner with which he acceded to the request of the Committee.

Agriculture.

INSECTS INJURIOUS TO THE CROPS.

The frequent occurrence of large quantities of shrivelled grains of wheat, appearing in specimens throughout various parts of Europe and America, besides numerous complaints from Agriculturists, testifying to the great devastation of their growing crops, which presented to them a phenomenon wrapt in mystery, led the Entomologist to study the cause,—and of late his researches have not been in vain. He demonstrates clearly the cause and consequence—the farmer's unsuspected enemies are by him discovered. The cause of the before-mentioned defect is ascertained to be the work of a true parasitic fly, of an extremely beautiful formation, termed by its scientific name *Cecidomyia tritici*, or Wheat Midge, myriads of which will be seen in the month of June, from seven till nine in the evening, swarming about the blossoming ears of wheat, for the sole purpose of depositing their eggs in them, which, when hatched, produce little yellow maggots or larvae, consequently injuring the young *ovary*, and preventing the grain from attaining its due growth and natural dimensions. The larvae can be seen in the ear by pulling back the chaff-scales, when the grain is formed. The following may be taken as a pretty accurate description of the female insect. It is of a pale ochreous hue, and hairy; its eyes are extremely black and coarsely granulated meeting on the crown nearly

covering the whole head. It has no *ocelli*—no visible indication of a mouth, except a short lip and two feelers. The antennae are as long as the body, *thorax* reddish ochre in colour, and the wings are longer than the body, of a whitish yellow pubescent and beautifully iridescent when seen in repose. The abdomen is short, tapering to a point, and furnished with an *ovipositor*, or instrument for depositing its eggs nearly three times as long as the insect itself. The male *Cecidomyia* resembles the above description, with the exception of the antennae which are different in form, and also, unprovided with an *ovipositor* or *acumens*. It appears rather strange, that Mr. Curtis, and the venerable naturalist Mr. Kirby, in making their numerous observations upon this insect, could not discover the male fly, but if those gentlemen would have visited the same scene of study the following day they would likely have seen it performing the duty which nature had assigned to it. We have seen, on two occasions, the male and female flies together on the wheat plant, and saw no indication by the common appearance of the female that it possessed so curious an instrument as the *ovipositor*, until upon pressing the anus, it was easily discovered. It has the power of unshathing it at pleasure. The larvae of this fly are accompanied by a fungus of an orange colour—"one farmer imagined that these larvae were of great use in feeding on this fungus." This shows a natural mistake for an unscientific person, however it tends to prove to experienced investigators the necessity of caution in connecting things with each other, simply because they are coincident. The accurate entomologist, Mr. Kirby, often discovered the female fly caught a prisoner by being unable to withdraw its *ovipositor*,—and after many attempts, he at last witnessed his long wished for scene, the operation of depositing the eggs, which he describes as follows.—"he gathered an ear upon which the flies were actively engaged, and was enabled by the aid of a pocket microscope to view this remarkable process.—He says, he could "very distinctly perceive the eggs passing one after another like minute air-bubbles, through the *regina*, the *aculeus* being wholly inserted into the *stret*." This process, he examined for fully ten minutes, before the "patient little animal disengaged itself and flew away." Many attempts have been made by entomologists to breed these insects but without success. Some suppose that the larvae, after they have remained in the ear for a certain period, enter the earth to become pupae;—but we could find no trace of its *chrysalides* upon examination of the earth which was taken from the locality where the insect was found in the ear; still, without doubt they could be hatched favorably in the earth, and among the dust and chaff thrown out from the thrashing machine, which we would recommend to be burned to prevent their increase. That they are hatched between the chaff-scales and the young *ovary* there can be no doubt, as we have found the membranous empty remains of the *chrysalides* attached to the chaff-scales. In 1845 this insect was very numerous, and their work of destruction in England immense. Mr. Kirby calculated the loss, by this

fly, in one field of wheat which he examined, as "at least twenty bushels in fifteen acres." Occurrences to this extent are very rare, and in this Province the insect under notice has not been so destructive to the wheat crops as in other countries—but it is clear that in some seasons they are more numerous than in others, their decrease may be attributed to the severity of the cold they are liable to encounter. Being very minute a great many perish during the third state of metamorphosis. Spallanzani, however, exposed the "eggs of the silk-worm to an artificial cold 23 degrees below zero, and yet in the subsequent spring they all produced caterpillars. He also discovered that "insects invariably die at the temperature of 14 degrees, that is at 18 degrees below the freezing point. This shows the effect of cold upon the eggs of an insect, which in the imago state is about seven or eight hundred times larger than the *Cecidomyia*, referred to above as only being affected by cold in the pupary state. Thus we have *Ichneumon* flies, very useful insects in many instances, these will hereafter be noticed; but the increase of the Midge cannot be checked by the natural labors of the Ichneumon.

Still we have another fly designated by its scientific name *Cecidomyia destructor*—commonly called the American Wheat fly, or Hessian fly. It derives this latter name from the idea prevailing on its first appearance that it was carried by the Hessian troops from Germany. In 1776, it committed great devastations on this continent. Its attacks commence in autumn, as soon as the young plant appears above the earth; they lay their eggs in the interior of the stem, which is so weakened that it cannot support the ear when the grain begins to swell, consequently the plant falls and perishes. Mr. Kirby in his papers upon this insect, says, "All the crops as far as it extended its flight, fell before this ravager. It first showed itself in Long Island, from whence it proceeded inland, at the rate of fifteen or twenty miles annually, and by the year 1789, had reached two hundred miles from its original station. But other authors testify that its progress at first was slow, about the rate of seven miles per annum, therefore, their ravages would be more considerable—their flight has not been more than five or six feet, at a time, (that is the extent of the horde in migrating.) Neither mountains nor the broadest rivers are a barrier to their career. At one time they were seen to cross the Delaware like a cloud.

The only remedy would be to burn the refuse of dust thrown out from the thrashing machine or from the barn floor. It would greatly check those minute pests of natural creation.

Natural History.

WHAT BECOMES OF THE FLIES?

The flies are gone, but where are they gone to? that is the question. At the close of summer, when they are busy buzzing around us in the shape of a visitation, it is certainly no easy matter to let them pass by us as the idle wind, but in one respect they are to most people like the wind too, since they scarce know whence they come, or